

***Response to Amendment***

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

***Response to Arguments***

2. Applicant's arguments with respect to claims 1 and 7 (and all claims depending therefrom whether directly or indirectly) have been considered but are moot in view of the new ground(s) of rejection. The new grounds of rejection is found in Siemens (EP 1 179 897 A2) (IDS Reference) which implements a transmission method of associating a table, transmitted in a first or previous frame, with the content of a next or subsequent frame.

**DETAILED ACTION**

***Claim Rejections – 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (EP 1 130 837 A2), in view of Siemens (EP 1 179 897 A2).
5. **Regarding claim 1**, Chen et al. discloses *a method of transmitting a plurality of forward error corrected blocks within a burst, comprising:*

a. *Including, using a computing device, a header in the burst indicating the coding rate of one of the blocks* (Abstract, see "...examine the header to (203) to determine a particular coding scheme [i.e. coding rate]...associated with the payload [i.e. includes one of the blocks]..."; Paragraph 0022, see "...payload 205 includes...multiple control or data fragments (303)...the fragments 303 vary in number (e.g., 1, 2, 4 or 9) per block based upon the selected modulation and coding schemes...").

Chen et al. does not disclose *varying, using the computing device, the forward error-correction coding rate among the forward error corrected blocks; and indicating, using the computing device, the coding rate of a subsequent one or more of the blocks independently from the coding rate of said one of the blocks, using data contained in said one of the blocks.*

However, Siemens discloses a transmission method in which a first frame contains information that is relevant to the decoding of a second frame transmitted after the first frame (Paragraph 0040; Figure 1). As shown in figure 1, frame T1 (i.e. *said one of the blocks*) contains a TAB\_T2 portion which contains information to be applied to frame T2 (i.e. *subsequent one or more of the blocks*). Frame T2 contains a similar portion which contains information to be applied to frame T3. Each portion is protected with an FEC code and also provides coding information for a subsequent frame (i.e. *indicating coding rate of subsequent block independently from the coding rate of said one of the blocks using data contained in said one of the blocks*) (Paragraph 0040). The *coding rates among these blocks are varied* as shown in the tables on page 4. This method in Siemens gives the decoder an appropriate amount of time to decode the error correction code (Paragraph 0039).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Siemens into Chen et al. in order to give the decoder enough time to decode an error correction code.

6. **Regarding claim 2**, Chen et al. in view of Siemens discloses *wherein said one of the blocks is a first one of the blocks to be transmitted* (Siemens, Figure 1 Frame T1 [said one of the blocks is a first] is the first frame to be transmitted).
7. **Regarding claim 3**, Chen et al. in view of Siemens discloses *wherein said header comprises a variable unique word* (Chen et al., Figure 2 Unique Word 201).
8. **Regarding claim 4**, Chen et al. in view of Siemens discloses *wherein the blocks contain packets addressed to a plurality of receivers* (Chen et al., Abstract, see "...protocol can be applied to...a satellite communication system (100) with multiple satellite terminals (103, 105)...").
9. **Regarding claim 5**, Chen et al. in view of Siemens discloses *wherein at least some of the packets are split between different ones of the blocks* (Siemens, Figure 1 and paragraph 0040 disclose interlacing the frames T1-T4 with the table portions splitting the frames).
10. **Regarding claim 7**, Chen et al. discloses *a method, comprising:*
  - b. *Transmitting, using a computing device, a data burst utilizing a unique word and a plurality of blocks, wherein the unique word is variable and indicates the transmission scheme of at least one block* (Abstract, see "...examine the header to (203) to determine a particular coding scheme [i.e. coding rate]...associated with the payload [i.e. includes one of the blocks]..."; Paragraph 0022, see "...payload 205 includes...multiple control or data fragments (303)...the fragments 303 [i.e. plurality of blocks] vary in number (e.g., 1,

2, 4 or 9) per block based upon the selected modulation and coding schemes..."; Figure 2 Unique Word 201).

Chen et al. does not disclose *a plurality of blocks and said at least one block indicates the transmission scheme of at least one other of said blocks independently from the transmission scheme of said at least one block.*

However, Siemens discloses a transmission method in which a first frame contains information that is relevant to the decoding of a second frame transmitted after the first frame (Paragraph 0040; Figure 1). As shown in figure 1, frame T1 (i.e. *said at least one block*) contains a TAB\_T2 portion which contains information to be applied to frame T2 (i.e. *one other of said blocks*). Frame T2 contains a similar portion which contains information to be applied to frame T3. Each portion is protected with an FEC code and also provides coding information for a subsequent frame (i.e. *indicating transmission scheme of one other block independently from the transmission scheme of said at least one block*) (Paragraph 0040). *The coding rates among these blocks are varied* as shown in the tables on page 4. This method in Siemens gives the decoder an appropriate amount of time to decode the error correction code (Paragraph 0039).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Siemens into Chen et al. in order to give the decoder enough time to decode an error correction code.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. in view of Siemens as applied to claim 1 above, and further in view of Golitschek (WO 02/058314 A1).

12. **Regarding claim 6**, Chen et al. in view of Siemens discloses the claimed invention above but does not specifically disclose *wherein the coding rate indicated in the header is less than or equal to the coding rate of the subsequent one or more blocks*. However, Golitschek a method wherein a first code word is adapted to a first code rate while subsequent code words are adapted to higher coding rates (Page 12 lines 22-25). This ensures a small granularity of the overall code rate and the overall coding rate near the optimum (Page 12 lines 24-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate this teaching from Golitschek into the system of Chen et al. in view of Siemens in order to ensure a small granularity of the overall code rate and the overall coding rate near the optimum.

13. Claims 14 -20 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. in view of Siemens, as applied to claim 1 above, and further in view of Thomas (US 6,697,642 B1).

14. **Regarding claim 14**, Chen et al. in view of Siemens discloses the claimed invention above but fails to specifically disclose the limitations of claim 14.

However, Thomas discloses *a method of transmission over a satellite link between a satellite station and a mobile satellite terminal* (Column 1 lines 43-44, see "...communications between a cellular radio telephone base station [i.e. satellite terminal] and a mobile station [i.e. mobile satellite terminal]...") *able to transmit at a selected one of a plurality of different forward error correction (FEC) coding rates* (Column 1 lines 48-50, see "...switch the coding rate for transmissions...", i.e. implies plurality of different coding rates) *wherein a change between*

*successive ones of said FEC coding rates provides a substantially constant change in gain over the satellite link* (It is well known in the art that the FEC coding rates directly impacts the gain in this type of transmission system because of signal quality and strength). Thomas further discloses that based on the measured signal quality, the base station can send an instruction to a mobile station to switch the coding rate for transmission therefrom (Column 1, lines 47-50). This disclosure means that at an initial coding rate, the mobile station transmits a signal to the base station (Column 1 lines 45-46, see "...monitoring the signal received at the respective base station..."), the base station sends an instruction to the mobile station to switch coding rates for subsequent transmission from the mobile station, and the mobile station transmits another signal with a switched coding rate (i.e. *at the terminal, transmitting a plurality of bursts* [plurality of bursts are constituted by signals before and after coding rate change], *wherein the FEC coding rates of the burst vary between at least some of said bursts* [switched coding rate indicates varying of FEC coding rates between bursts] *in response to a signal from the satellite station* [based station instruction to switch coding rates]). Obviously, if the signal quality is low, then the instruction to switch the coding rate will cause the mobile station to transmit at a coding rate that improves the signal quality.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate this teaching of Thomas into the system of Chen et al. in view of Siemens in order to improve signal quality of subsequent transmission from satellite terminal to a satellite station.

15. **Regarding claim 15**, Chen et al. in view of Siemens in view of Thomas discloses that *said signal is dependent on a reception quality of one or more of said bursts previously received*

*from the mobile satellite terminal by the satellite station* (Thomas, Column 1 lines 47-50, see “...based on measure signal quality, the base station can send an instruction [i.e. signal]...”; Column 1 lines 45-46, see “...monitoring the signal received at the respective base station...”, i.e. signal previously received from the mobile satellite terminal).

16. **Regarding claim 16**, Chen et al. in view of Siemens in view of Thomas discloses that *the mobile satellite terminal selects the FEC coding rates of at least one of said bursts dependent on a reception quality of one or more transmissions transmitted from the satellite station to the mobile satellite terminal if said signal is not received from the satellite station within a timeout period* (Thomas, Column 2 lines 46-56, see “...determining a period of inactivity [i.e. timeout period for receiving signal]...determining signal quality of a signal received during said period [i.e. reception quality of one or more transmissions from the satellite station...coding means operable at two or more coding rates and responsive to a determined signal quality to switch between coding rates [i.e. select coding rate of one of said bursts dependent upon reception quality from satellite station to terminal]...”).

17. **Regarding claim 17**, Chen et al. in view of Siemens discloses the claimed invention above but fails to specifically disclose the limitations of claim 17.

However, Thomas discloses *a method of transmission over a satellite link between a satellite station and a mobile satellite terminal* (Column 1 lines 43-44, see “...communications between a cellular radio telephone base station [i.e. satellite terminal] and a mobile station [i.e. mobile satellite terminal]...”) *able to transmit at a selected one of a plurality of different forward error correction (FEC) coding rates* (Column 1 lines 48-50, see “...switch the coding rate for transmissions...”, i.e. implies plurality of different coding rates) *wherein a change between*

*successive ones of said FEC coding rates provides a substantially constant change in gain over the satellite link* (It is well known in the art that the FEC coding rates directly impacts the gain in this type of transmission system because of signal quality and strength). Thomas further discloses that based on the measured signal quality (i.e. *determining a reception quality of the first burst*), the base station can send an instruction to a mobile station to switch the coding rate for transmission therefrom (i.e. *transmitting a command to the mobile satellite terminal to select a different one of the FEC rates for transmission of a second subsequent burst*) (Column 1, lines 47-50). This disclosure means that at an initial coding rate, the mobile station transmits a signal to the base station (Column 1 lines 45-46, see "...monitoring the signal received at the respective base station...", i.e. *at the satellite station, receiving a first burst from the mobile satellite terminal*), the base station sends an instruction to the mobile station to switch coding rates for subsequent transmission from the mobile station (i.e. once the signal quality is measured, instruction is sent *if the reception quality does not meet a predetermined criterion*), and the mobile station transmits another signal with a switched coding rate (i.e. *second transmission is received with a reception quality which meets the predetermined criterion*). Obviously, if the signal quality is low, then the instruction to switch the coding rate will cause the mobile station to transmit at a coding rate that improves the signal quality.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate this teaching of Thomas into the system of Chen et al. in view of Siemens in order to improve signal quality of subsequent transmission from satellite terminal to a satellite station.



18. **Regarding claims 18 and 23**, Chen et al. in view of Siemens in view of Thomas does not specifically disclose that *said substantially constant change in gain is approximately 1 dB*,

however, it is well known in the art that change in gain between a satellite station and a terminal can be constant at 1dB.

19. **Regarding claims 19 and 24**, Chen et al. in view of Siemens in view of Thomas discloses that *the satellite station is a satellite ground station for communicating with the satellite terminal via a satellite* (Chen et al., Figure 1 Base 101 is satellite ground station communicating with satellite terminals ST 103 and 105 via satellite 107).

20. **Regarding claims 20 and 25**, Chen et al. in view of Siemens in view of discloses that *said satellite station is a satellite* (Chen et al., Figure 1 label 107 is the satellite).

21. Claims 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. in view of Siemens as applied to claim 1 above, and further in view of Mantha (WO 01/91407 A1).

22. **Regarding claim 26**, Chen et al. in view of Siemens discloses the claimed invention above but fails to specifically discloses *wherein the transmission is from a transmitter to a plurality of receivers, and the transmission includes a plurality of packets addressed respectively to the receivers, further comprising: determining the least capable of the receivers; and selecting one or more parameters of the transmission so as to match the capabilities of the least capable of the receivers*.

However, Mantha discloses a system comprising a transmitter and one or more of a plurality of receivers (i.e. *from a transmitter to a plurality of receivers*) (See Abstract), wherein

the *transmission includes a plurality of packets addressed respectively to the receivers* (Page 10 4th paragraph, see "...Payloads 108 can be specifically addressed to a particular subscriber stations 28a, 28b... or 28n..."). Mantha also discloses *determining the least capable of the receivers* (Page 10 1st paragraph, see "...each subscriber station 28 reports its reception quality to base station 24..."; 3rd paragraph, see "...header 104 is always packaged into block B in a robust manner to provide a relatively high level of confidence of recovery by all subscriber stations..."; 4th paragraph, see "...broadcast packets can be packaged for the worst reception quality expected for all of the intended receivers..."; i.e. The worst reception quality constitutes a *least capable receiver* since each receiver reports its reception quality to the transmitter. Thus, the transmitter knows the worst reception quality [i.e. *least capable receiver*], and packages the transmission accordingly). Mantha further discloses *selecting one or more parameters of the transmission so as to match the capabilities of the least capable of the receivers* (Page 10 3rd paragraph, see "...header 104 is always packaged into block B in a robust manner to provide a relatively high level of confidence of recovery by all subscriber stations..."; 4th paragraph, see "...broadcast packets can be packaged for the worst reception quality expected for all of the intended receivers..."; i.e. The packaging constitutes *selecting one or more parameters to match the capabilities of the least capable of the receivers* because the packaging is actually FEC coding [Page 7 1<sup>st</sup> paragraph]). As stated previously, this robust packaging based on receivers' reception quality provides a high level of confidence that a transmission to the receivers will be able to be recovered by all of the receivers (Page 10 3rd paragraph).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Mantha into the system of Chen

et al. in view of Siemens in order to allow a transmission to be transmitted based on the reception qualities of a plurality of receivers, such that the transmission will be able to be recovered by all of the receivers.

23. **Regarding claim 27**, Chen et al. in view of Siemens in view of Mantha discloses *wherein the transmission includes a forward error-corrected block having a coding rate selected to match the capabilities of the least capable of the receivers* (Mantha, Page 7 1st paragraph, see "...header 104 is packaged in a robust manner to increase probability...header 104 comprises...coding the information bits for forward error correction (FEC)...").

24. **Regarding claim 28**, Chen et al. in view of Siemens in view of Mantha discloses *wherein the transmission is from a transmitter to a plurality of receivers* (Mantha, Abstract, see "...from a transmitter to one or more of a plurality of receivers..."), *and wherein at least one of the blocks includes part or all of a plurality of packets addressed to different ones of said plurality of receivers* (Mantha, Figures 4a-4c show frames containing multiple blocks and Figure 5 shows the structure of a single block within the frame; Page 10 4th paragraph, see "...Payloads 108 can be specifically addressed to a particular subscriber stations 28a, 28b... or 28n...") *and has a coding rate selected so as to match the capabilities of the least capable of the receivers to which the packets are addressed* (Page 10 3rd paragraph, see "...header 104 is always packaged into block B in a robust manner to provide a relatively high level of confidence of recovery by all subscriber stations..."; 4th paragraph, see "...broadcast packets can be packaged for the worst reception quality expected for all of the intended receivers...", i.e. The packaging constitutes *selecting the coding rate to match the capabilities of the least capable of the receivers* because the packaging is actually FEC coding [Page 7 1<sup>st</sup> paragraph]).

25. **Regarding claim 29**, Chen et al. in view of Siemens in view of Mantha discloses *wherein at least some of the packets are split between different forward error-corrected blocks*. More specifically, Siemens discloses a protection method which uses interlacing for FEC blocks and data frames. Siemens specifically discloses two frames (T1 and T2) being transmitted one after the other on a channel. The frame T1 contains a table relevant to frame T2, and in this table the information M1, M2, etc. appear and is protected with an FEC code (See Paragraph 0040 and Figure 1). From figure 1, it is shown that *the packets (T1 and T2) are split between different forward-error corrected blocks* (TAB\_T2 which is a FEC block relevant to packet T2). This interlacing performed in this protection method is used to give a decoder a proper amount of time to decode the error correction code (Paragraph 0039).

26. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. in view of Siemens as applied to claim 1 above, and further in view of Vistar (WO 99/49592).

27. **Regarding claim 30**, Chen et al. in view of Siemens discloses the claimed invention about but fails to disclose the features of Applicant's claim 30.

However, Vistar discloses a communication system which *assigns a plurality of packets addressed to a respective plurality of wireless receivers to a plurality of wireless bearers* (See Figure 1 for MSAT 12 communicating with Mobile Terminals 11 [i.e. plurality of receivers] via the carriers 17 [i.e. plurality of bearers]; Page 6 lines 21-25, see "...addresses the packets to the appropriate terminal..."); *identifies the receiving capabilities of the wireless receivers* (Page 7 lines 4-10, see "...carriers have different channel rates...to support terminals with different antenna characteristics, such as gain, size, etc..."; i.e. This constitutes *identifying the receiving*

*capabilities* because a terminal is matched to channel, not solely based on the channel rate, but also based on the characteristics of antennas of the terminals [i.e. *receivers*]. Furthermore, the antennas directly affect the receiving capability of the terminals); *and assigning packets addressed to ones of the receivers having similar receiving capabilities onto the same one of said bearers* (Page 7 lines 4-10, see "...carriers have different channel rates...to support terminals with different antenna characteristics, such as gain, size, etc..."; Page 6 lines 25-30, see "...incoming data packets are buffered and then mixed with one or more digital subcarriers [i.e. *assigning packets addressed to ones of the receivers having similar receiving capabilities onto the same one of said bearers*], depending on the data rate..."; i.e. As stated previously stated a channel/subcarrier is matched to a terminal based on not only the channel rate but also based on the characteristics of the antenna of the terminal [i.e. receiving capabilities]. Since this is true, it is obvious that when packets are mixed with one or more digital subcarriers based on data rate/channel rate, the packets are also being assigned to a subcarrier/channel based on the characteristics of the antenna of the receiving terminal. Vistar further states that channel assignments are carried to the remote terminals via a control channel [Page 6 lines 28-30]). As previously stated, this method allows the system to support terminals that have different receiving capabilities (different antenna characteristics, Page 7 lines 4-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Vistar into the system of Chen et al. in view of Siemens in order to support terminals that have different receiving capabilities.

28. **Regarding claim 31**, Chen et al. in view of Siemens in view of Vistar discloses *a method of assigning a plurality of receivers to a plurality of bearers for reception of packet addressed to*

*the receivers* (Vistar, See Figure 1 for MSAT 12 communicating with Mobile Terminals 11 [i.e. plurality of receivers] via the carriers 17 [i.e. plurality of bearers]; Page 6 lines 21-25, see "...addresses the packets to the appropriate terminal..."); *in a first, low traffic condition, assigning packets to a smaller number of bearers containing packets addressed to receivers of differing receiving capabilities* (Vistar, Page 7 lines 6--8, see "...packets arrive...at a very low bit rate...send them out on a single carrier [i.e. bearer]...", i.e. smaller number of bearers for low traffic condition); *and in a second, high traffic condition, assigning packets to a greater number of bearers* (Vistar, Page 7 lines 8-9, see "...rate is too great for a single carrier...distributed across one or more channels...", i.e. greater number of bearers for high traffic condition) *and assigning packets addressed to those of the receivers having similar receiving capabilities onto the same one of said greater number of bearers* (Page 6 lines 25-27, see "...incoming data packets are buffered and then mixed with one or more digital subcarriers [i.e. bearers] depending on data rate..." i.e. assigning packets addressed to those of the receivers having similar receiving capabilities onto the same one of said greater number of bearers; Page 7 lines 4-6, see "...carriers can have different channel rates...at different power levels to support terminals with different antenna characteristics...").

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to OTIS L. THOMPSON, JR whose telephone number is (571)270-1953. The examiner can normally be reached on Monday to Thursday 7:30 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chirag Shah can be reached on (571)272-3144. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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May 26, 2010

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